PEACE/WILLISTON
FISH & WILDLIFE
COMPENSATION
PROGRAM

BC hydro

BRITISH
COLUMBIA

A Reconnaissance Survey Of Grayling Lake

A. R. McLean and D. A. Jesson
1990

PWFWCP Report No. 101

The Peace/Williston Fish & Wildlife Compensation Program is a cooperative venture of BC Hydro and the provincial fish and wildlife management agencies, supported by funding from BC Hydro. The Program was established to enhance and protect fish and wildlife resources affected by the construction of the W.A.C. Bennett and Peace Canyon dams on the Peace River, and the subsequent creation of the Williston and Dinosaur Reservoirs.

Peace/Williston Fish and Wildlife Compensation Program, 1011 Fourth Ave. 3rd Floor, Prince George B.C. V2L 3H9

Website: *www.bchydro.bc.ca/environment/initiatives/pwcp/*

This report has been approved by the Peace/Williston Fish and Wildlife Compensation Program Fish Technical Committee.

Citation: A. R. McLean and D. A. Jesson. 1990. A reconnaissance survey of Grayling Lake. Peace/Williston Fish and Wildlife Compensation Program, Report No. 101. 26pp plus appendices.

Author(s): Allister R. McLean[1] and Duane A. Jesson[1]
Address(es): [1] Peace/Williston Fish and Wildlife Compensation Program. 1011 Fourth Ave., 3rd Floor Prince George, B.C. V2L 3H9

A RECONNAISSANCE SURVEY OF

GRAYLING LAKE

WATERSHED: PARSNIP RIVER

DATE OF SURVEY: JUNE 25. 26. 1990

FIELD CREW LEADER: D. A. JESSON

FIELD ASSISTANT: A. R. MCLEAN

REPORT PREPARED BY: A. R. MCLEAN and
D. A. JESSON

WILLISTON FISHERIES PROJECT

B. C. HYDRO

ENVIRONMENTAL RESOURCES

and

MINISTRY OF ENVIRONMENT

RECREATIONAL FISHERIES BRANCH

RELEASED BY: _____

D.H.G. Ableson, Regional Fisheries Biologist

LAKE: **GRAYLING**

SYSTEM NAME: UNNAMED C.

A.S.A.P. REFERENCE NO.:

SYSTEM NO: 25-1190-010

DATA ON FILE FOR THIS SURVEY

Location	X	Dissolved O2/Temp. Profiles	X
Physical Data	X	Winter Dissolved 02/Temp. Profiles	
Bench Mark	X	Netting Record	X
Terrain Features	X	Lake Catch Summary	X
Access	X	Individual Fish Data	X
Resorts and Campsites	X	Fish Preserved	
Other Developments	X	Stomach Analysis	X
Obstructions and Pollutions	X	Scale Reading	X
Special Restrictions	X	Location of Inventory Sites	X
Aquatic Plants	X	Photograph Directory	X
Wildlife Observations	X	Appendices:	
Miscellaneous Comments	X	A: Water Chemistry Analysis	X
Lake Drainage	X	B: Tributary Stream Data	X
Fisheries Management Comments	X	Bathymetric Map Reduction	X
History of Previous Surveys	X	Bathymetric Map	X
Water Chemistry Summary	X		

LOCATION

Location:	22 km south of Mackenzie		
Elevation:	808 m+/-		
Latitude/Longitude:	55°08'11":123°11'29"	U.T.M.:	10.4879.61098
Management Unit:	7-29	N.T.S. Map No.:	93 0/3

Drainage: Outlet . C --> Lignite C. -->Williston L (Parsnip Reach)-->Peace R.

PHYSICAL DATA

Lake Drainage Area:		Volume:	7,990,000 m^3
Water Surface Area:	470,000 m^2	Flushing Rate:	
Area above 6 m contour:	98,000 m^2	Perimeter of Islands:	200m
Shoreline Perimeter:	3,800 m	Number of Islands:	1
Maximum Depth:	37.3m	Mean Depth:	17.0m
Filterable Residue (TDS):	126 m/	Secchi Reading:	5.05 m

Sounding Device: Lowrance X-15 Elevation Source: Contour interpolation

BENCHMARK

(Iron spike, center of red circle) located 2.0 m above present water level in a 52 cm diameter spruce tree. The tree is located on the NE shore (outlet end), 3.4 m from the water's edge.

High water mark: 0.14 m above water level at time of survey.

Lake: **GRAYLING**

TERRAIN FEATURES

Immediate Shoreline:

The shoreline is moderately to steeply sloped around the entire lake. Generally the lake bottom drops off quickly from shore, except at the north (outlet) end and marsh areas. The lake perimeter consists primarily of an Equisetum sp. and sedge grass fringe extending 1 to 3 m from shore, with more extensive marsh areas occurring along the west shore. A fringe of alder fronts most of the shoreline. In places, spruce, fir, or Lodgepole pine occur to the water's edge. Boating access to shore is generally good. Some deadfall, especially in the bays and at either end of the lake may prove hazardous to boaters. Shoreline access by land is generally good where trails exist (game or trapper's), but poor in other areas due to steep terrain and dense underbrush. The shoreline substrate consists mainly of cobble, gravel, organics, and some boulder.

Surrounding Country:

Grayling Lake is surrounded by low rolling hills, except for the north (outlet) end, which flattens out and slopes down a hillside. The forest cover is mature, first growth, consisting of a predominately coniferous forest (spruce, fir, and Lodgepole pine), giving way to a mixed coniferous and deciduous (birch and poplar) forest away from the lake. Undergrowth is dense and consists of devils club, wild roses, ferns, alder, and other low growing shrubs. No visible logged patches can be seen from the lake, however, logging has taken place to the north.

Grayling Lake is situated within the sub-boreal spruce biogeoclimatic zone.

Lake: **GRAYLING**

ACCESS

Directions:

Grayling Lake is approximately a 10 minute helicopter flight from Windy Point. A float plane could also be used to access this lake.
According to the Mackenzie Forest Service, a trail exists from a logged area off of the Finlay-Philip Forest Service road. The trail is apparently unmarked and overgrown, leading to the north end of Grayling Lake. The trail is approximately 2.0 km in length, requiring a hike of about 45 minutes.
The trail was not investigated as part of this survey.

Road Type and Conditions:

Not applicable.

Restrictions:

No restrictions were noted.

RESORTS AND CAMPSITES

None. However, Jim Ladds, Ministry of Forests Recreation Officer in Mackenzie, has expressed an interest in upgrading the trail and developing a recreation site near the lake.

OTHER DEVELOPMENTS

An old trail (game or trapper's) exists around much of the lake's perimeter.
An old helicopter pad is located on the west shore of the lake.

Lake: **GRAYLING**

OBSTRUCTIONS AND POLLUTIONS

Beaver dams located on the outlet and one inlet are obstructions to upstream fish passage.

SPECIAL RESTRICTIONS

No special restrictions were noted.

AQUATIC PLANTS

Aquatic plants are moderately abundant and distributed mainly in the shallows of bays and near shore.
The following species were identified in the field. None were collected.

Nuphar sp.	Chara sp.
Equisetum fluviatile	Myriophyllum sp.
Potamogeton sp.	sedge grass

WILDLIFE OBSERVATIONS

One eagle and numerous loons were sighted.

MISCELLANEOUS COMMENTS

Numerous rainbow trout were observed jumping.
One moose carcass was found floating in the south end of the lake.

Bathymetric map: The outline for this lake is from an enlargement of aerial photograph B.C. 77092 No. 180, flown August 15, 1977.

Lake: **GRAYLING**

LAKE DRAINAGE

General:

Grayling Lake has 5 inlets and 1 outlet. Three of the five inlets are intermittent. The outlet flows 2.5 km (0.5 km down a moderate slope and 2.0 km through low-lying marsh) to its confluence with Lignite Creek.

Major Systems:

There are no major systems.

Minor Systems:

Unnamed C. - outlet

The outlet drains the lake at the north end. The lake level is controlled by an inactive, overgrown beaver dam (18.5 m in length and 0.9 m in height) located approximately 35 m downstream from the lake. Flow is present through the right bank side of the dam. However, the dam appears to be an obstruction to upstream fish movement. A second inactive, overgrown beaver dam (9.0 m in length and 0.5 m in height) is located 80 m downstream of the lake. It is a possible obstruction to upstream fish movement. The pond located upstream of the dam has a wetted width of 15 m and an average depth of 35 cm. A third partially breached beaver dam is located 110m downstream of the lake. All ponds resulting from the beaver dams have organic substrate and little flow. There is no salmonid spawning habitat. At approximately 120 m downstream from the lake, beaver activity is no longer present and the stream is flowing.

At 160 m downstream of the lake, the outlet has a wetted width of 3.0 m, an average depth of 22 cm and a gradient of 1.5%. Water temperature is 18°C and velocity is 0.33 m/sec. Good salmonid spawning and rearing habitat is present in this section of stream. There is a good pool/riffle ratio with overhanging vegetation (ie. devils club) providing excellent cover. Little overwintering habitat is present. The investigation terminated at 350 m downstream of the lake.

Refer to stream data sheets for additional outlet information.

Lake: **GRAYLING**

Unnamed C. - inlet #1

Inlet #1 enters Grayling Lake along the south shore. At 30 m upstream of the lake, the stream has a wetted width of 1.7 m, an average depth of 8 cm and a gradient of 2.5%. Water temperature is 7°C and the velocity is 0.29 m/sec.
At approximately 175 m upstream of the lake, the stream has a wetted width of 1.7 m, an average depth of 10 cm and a gradient of 1.5%.
Of the 200 m of stream investigated, salmonid spawning habitat ranges from fair to good, with overhanging vegetation (alder, devils club and fern) providing cover. Stream depth may limit overwintering capabilities.
This stream probably accounts for the majority of rainbow trout recruitment to the lake.

Refer to stream data sheets for additional information.

Unnamed C. - inlet #2

This inlet enters the west shore of the lake. Three beaver dams are present within the initial 70 m of the stream. The first dam (12.0 m in length and 0.75 m in height) is located approximately 30 m upstream from the lake. The resulting beaver pond has an organic substrate and is littered with deadfall and standing drowned trees. The pond is approximately 8.0 m in width and has a maximum depth of 75 cm. The other dams are located at 50 m and 70 m upstream from the lake. The investigation terminated at 70 m, however, additional beaver dams are believed to occur upstream. The inlet offers no obvious fisheries enhancement potential.

Unnamed Creeks - seasonal inlets

Three seasonal inlets enter Grayling Lake. These inlets flow through organics and offer no fisheries potential.

Lake: **GRAYLING**

FISHERIES MANAGEMENT COMMENTS

Grayling Lake has a large population of smaller size rainbow trout. One overnight net set yielded 75 rainbow (average length 27.5 cm and average weight 269 g) and one peamouth chub. In addition, rainbow juveniles and peamouth chub were captured in minnow traps. Angling produced three rainbow."

It may be possible to increase the size of the rainbow in this lake, over time, through an increase in angler effort. This could be achieved through the upgrading of the present trail and promotion. The Mackenzie Forest Service has recently expressed an interest in upgrading the trial access into Grayling Lake and developing a recreation site near the lake. Once access is improved, the lake should be managed for a low to moderate use fishery. Special regulations should be considered to allow for an increase in rainbow trout possession limits due to the present surplus population.

Stock assessment should be undertaken in 3 to 5 years in order to monitor the rainbow population, as more anglers are expected to fish the lake. If rainbow stocks decline to a point where natural production cannot keep up with angler demand, native stocks can be supplemented with an occasional stocking.

Rainbow trout recruitment back to the lake appears to be good, provided mainly from the inlet entering the south end. If required, future enhancement options exist in the outlet and the fore mentioned inlet. Deadfall removal from the outlet mouth and beaver dam removal from the outlet proper would provide rainbow trout with access to spawning gravel further downstream. Outlet beaver dams at the time of survey did not appear to be active, however, any new infestation could lead to a yearly maintenance program against dam construction. A coarse fish barrier on the outlet is suggested as a means of stopping any possible migration of coarse fish species (especially suckers and northern squawfish) moving upstream from Williston Lake via Lignite Creek. Some minor stream clearance and complexing over some of the more extensive riffle areas in the inlet may benefit rainbow production.

Lake: **GRAYLING**

HISTORY OF PREVIOUS SURVEYS

Lake Surveys:

No known previous surveys.

Other Related Surveys:

None known.

Lake: **GRAYLING**

WATER CHEMISTRY SUMMARY **Limnology Station No. 1**

Field Conditions:

Date:	June 26, 1990		
Time:	1300 hrs	Air Temperature:	15°C
Wind Velocity:	10-15 km/hr	Wind Direction:	south
Cloud Cover:	9/10 o.c.	Surface Condition:	heavy ripple
Secchi Disc:	5.05 m	Water Colour:	slightly tannic

Method(s) Used:

Dissolved Oxygen:	YSI model 58 oxygen/temperature meter
Water Temperature:	YSI model 58 oxygen/temperature meter
Air Temperature:	Hand-held alcohol thermometer
pH (field):	Digital pH pocket tester
H2S (field):	Hach H2S field test kit
Laboratory Used:	Zenon Environmental Inc. B.C. Laboratory Services
Water Sampler:	Verticle Alpha Water Bottle (Vandorn)
Substrate Sampler:	Substrate sample not taken

Water Sample Chemistry: SEAM Site No.: Not determined

	Sampling Depths	
	Surface (O m)	Lower (30.0 m)
pH (field)	8.6	7.9
pH (lab)	8.3	7.6
Specific Conductance (lab)	176 umhos/cm	192 umhos/cm
Filterable Residue 105°C (lab)	126 mg/l	130 mg/l
H2S (field)	- mg/l	0.0 mg/l

Bottom Depth:	36.0 m
Substrate Sample Depth:	- m

Comments:

No H_2S odour detected.

Lake: **GRAYLING**

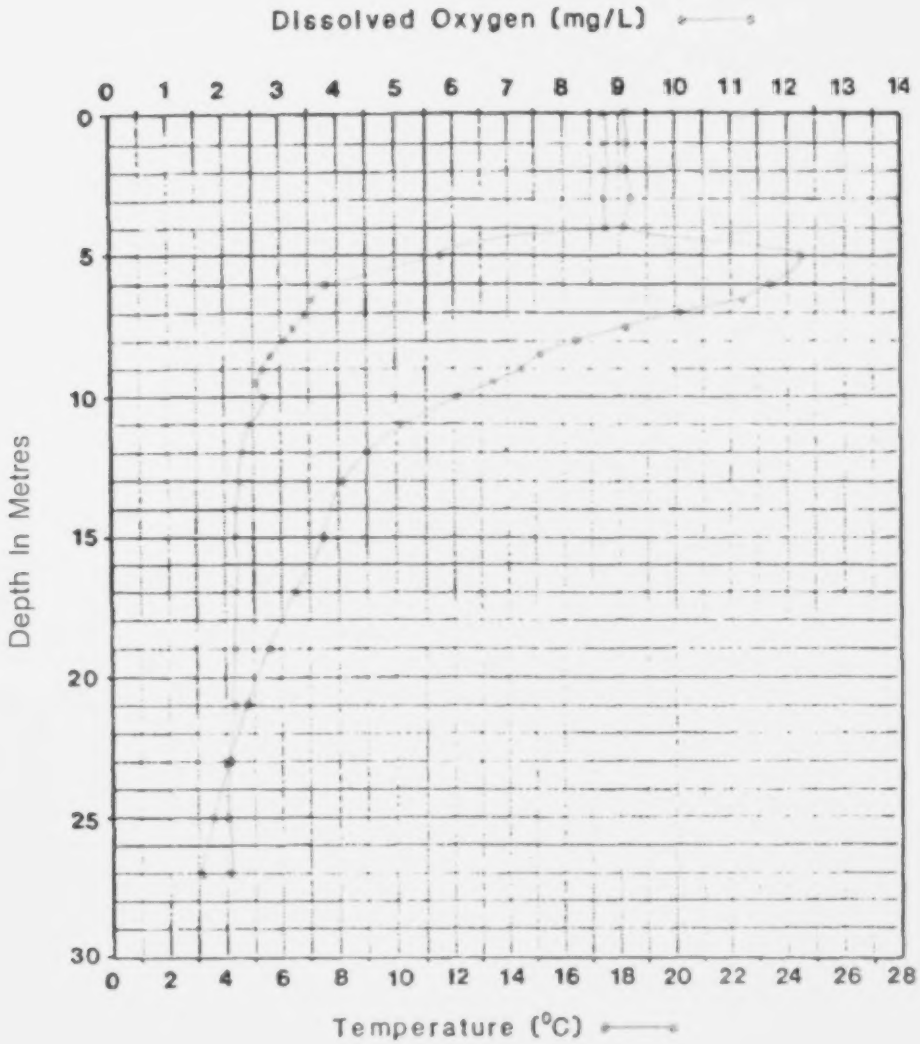
DATE: June 26, 1990

SUMMER OXYGEN/TEMPERATURE DATA

Depth (m)	02 (mg/l)	Temp (°C)
surface	9.1	17.4
1.0	9.2	17.4
2.0	9.2	17.4
3.0	9.3	17.4
4.0	9.1	17.4
5.0	12.3	11.6
6.0	11.7	7.7
6.5	11.3	7.2
7.0	10.1	6.9
7.5	9.2	6.5
8.0	8.3	6.2
8.5	7.6	5.7
9.0	7.3	5.4
9.5	6.7	5.2
10.0	6.1	5.4
11.0	5.1	4.9
12.0	4.5	4.7
13.0	4.1	4.6
15.0	3.8	4.4
17.0	3.3	4.4
19.0	2.8	4.3
21.0	2.4	4.3
23.0	2.1	4.2
25.0	1.8	4.2
27.0	1.6	4.2
36.0	Bottom	

Comments: Windy conditions caused the oxygen/ temperature cable and probe to angle out slightly during readings.

DISSOLVED OXYGEN AND TEMPERATURE PROFILE



Lake: **GRAYLING**

NETTING RECORD

Mesh sizes experimental order: 25, 76, 51, 89, 38, 64 mm

NETTING SITE #1

Type:	Sinking monofilament		
Date Set:	June 25, 1990	Time:	1515 hrs
Date Lifted:	June 26, 1990	Time:	1000 hrs
Net Dimensions:	Length: 91.4m	Depth:	2.4 m
Shallow End Mesh Size:	25 mm	Depth:	2.5 m
		Substrate:	organics
Deep End Mesh Size:	64 mm	Depth:	17.0 m
		Substrate:	organics

Comments:

Rainbow captured throughout the net.

Lake: **GRAYLING**

LAKE CATCH SUMMARY

SPECIES	NET SITE NO.				ANGLED	OTHER	TOTAL	NUMBER SAMPLED	NUMBER PRESERVED	SIZE RANGE (cm)
	1	2	3	4						
Rainbow trout	75				3		78	44	--	11.1 - 32.6
Peamouth chub	1				-	-	1	--	--	10.9

Comments:
Two anglers fishing for one hour landed three small (150-250 g) rainbow trout.
All rainbow trout sampled were heavily parasitized with tapeworms.
Some fish had gill parasites.
Some rainbow were thin in appearance.

Minnow Traps:

BAIT: Sardines

#	HOURS	DEPTH (m)	SUBSTRATE	SPECIES	SIZE RANGE (cm)
1	21.0	0.7	organics	1 leech 5 peamouth chub	avg. 7.0
2	20.5	1.2	organics	5 rainbow trout 1 leech	9.0 -->14.5
3					

Comments:

Lake: GRAYLING

INDIVIDUAL FISH DATA

Date Captured: JUNE 25, 26, 1990

Method of Capture: Sinking monofilament gillnet

M -Male
F -Female
?-Not Obvious

IMM - Immature
MG -Maturing
MT -Mature
GV -Gravid
SP -Spent
? -Not Obvious

EG -Egg
FR -Fin Ray
HD -Head
ML -Milt
OT -Otolith

SC -Scale
ST -Stomach
TG -Fish Tag
WF -Whole Fish

Species	Fork Length (cm)	Weight (g)	Sex	Gonadal maturity	Sample Type	Age (yr)	Stomach Contents Plankton	Insects	Fish	Other	Comments
Rainbow	12.0	20	?	IMM	SC	1+					
Rainbow	12.6	30	?	IMM	SC	1+	Gammarus sp.	insects			
Rainbow	24.8	190	F	MG	SC	4+	Gammarus sp.	beetles, flying ins.			tapeworms
Rainbow	26.6	220			SC	?					regenerated scales
Rainbow	26.6	220	F	MG	SC	5+?	plankton Gammarus sp.				tapeworms; regenerated scales
Rainbow	26.7	210	F	MG	SC	4+	plankton				tapeworm nodule & tapeworms; recently spawned
Rainbow	26.8	200	F	SP	SC	5	plankton				organs adhered; tapeworms; new eggs forming
Rainbow	26.8	250	F	MG	SC	3+	plankton	flying insects			tapeworms
Rainbow	27.0	250			SC	?					
Rainbow	27.4	250	M	MG	SC	3+?	plankton				gill lice; organs adhered; tapeworms regenerated scales
Rainbow	27.4	230	F	MG	SC	4					recently spawned; tapeworms
Rainbow	27.8	240	F	MG	SC	4	plankton				recently spawned; tapeworms
Rainbow	27.8	230			SC	4+					
Rainbow	28.0	280			SC	3+					
Rainbow	28.0	280			SC	3+					
Rainbow	28.0	230	M	MG	SC	3+					gill lice; tapeworms
Rainbow	28.0	260	?		SC	3+	plankton				organs adhered; tapeworms
Rainbow	28.0	280			SC	4+					
Rainbow	28.2	290			SC	4+					
Rainbow	28.4	280	F	MG	SC	4+					tapeworms
Rainbow	28.5	250	M	MG	SC	4+					tapeworms; organs adhered
Rainbow	28.5	270	F	MG	SC	4+	plankton, Gammarus sp.	beetles			organs adhered
Rainbow	28.9	270	M	MG	SC	3+	Gammarus sp. plankton				tapeworms; organs adhered
Rainbow	28.9	250	F	MG	SC	4+	plankton				tapeworms
Rainbow	29.0	220			SC	4+					

Lake: **GRAYLING**

INDIVIDUAL FISH DATA

Date Captured: JUNE 25. 26. 1990

Method of Capture: Sinking monofilament gillnet

M -Male
F -Female
? -Not Obvious

IMM -Immature
MG -Maturing
MT -Mature
GV -Gravid
SP -Spent
? -Not Obvious

EG -Egg
FR -Fin Ray
HD -Head
ML -Milt
OT -Otolith

SC -Scale
ST -Stomach
TG -Fish Tag
WF -Whole Fish

Species	Fork Length (cm)	Weight (g)	Sex	Gonadal maturity	Sample Type	Age (yr)	Stomach Contents: Plankton	Insects	Fish	Other	Comments
Rainbow	29.2	300			SC	3+					
Rainbow	29.3	290	?	MG	SC	4+	Gammarus sp. plankton				organs adhered; tapeworms
Rainbow	29.6	250 est.	F	MG	SC	3+					angler caught; tapeworms in stomach
Rainbow	30.0	310	M	MG	SC	3+	plankton				tapeworms: organs adhered
Rainbow	30.2	320	M	MG	SC	5	plankton	beetles			tapeworm nodule; tapeworms
Rainbow	30.2	310	M	MG	SC	3+					tapeworms; body organ adhered to wall
Rainbow	30.4	340	F	SP	SC	3+	plankton				organs adhered to body wall; tapeworms
Rainbow	30.4	340	M	MG	SC	4+	plankton				tapeworms
Rainbow	30.4	320			SC	3+					
Rainbow	30.4	350	M	MG	SC	3+	plankton				tapeworms
Rainbow	30.5	300	F	GV	SC	3	plankton				spawnbound; gill lice; tapeworms
Rainbow	30.5	330	M	MG	SC	3+	plankton	beetle			tapeworms
Rainbow	31.0	330	F	MG	SC	3+		flying insects			tapeworms
Rainbow	31.1	320	M	MG	SC	4+	plankton				tapeworms
Rainbow	31.2	300	M	MG	SC	3+	plankton				tapeworms
Rainbow	31.5	350	M	MG	SC	4+	plankton				tapeworms
Rainbow	32.0	350	M	MG	SC	3+	plankton, Gammarus sp.	beetles			tapeworms
Rainbow	32.5	360	M	MG	SC	4+	plankton,				tapeworms
Rainbow	32.6	350	M	MG	SC	3+					gill lice; organs adhered to body wall; tapeworms

*** 32 additional rainbow trout were captured, but were not sampled due to time restraints. Size range 11.1 --> 32.3 cm.**

Age determination completed under contract by:
Margaret McDonald
Box 243
Midway, B.C.
VOH 1MO

Lake: **GRAYLING**

PHOTOGRAPH DIRECTORY

Negative #	Plate #	**Description**
R4:24	1	Aerial view of Grayling Lake looking south.
R5:19,20	2	Panoramic view of Grayling Lake shoreline looking north (toward outlet) from south end of lake.
R5:3,4	3	Panoramic view of Grayling Lake shoreline looking south from north end of lake.
R5:25	4	Aerial view of Grayling Lake outlet looking south. Arrow indicates beaver dam on outlet, approximately 35 m downstream from lake.
R5:9	5	View looking upstream from breached beaver dam on outlet, approximately 110 m downstream from lake. Arrows indicate the beaver dams located at 35 m and 80 m downstream from lake, respectively.
R5:11	6	View looking downstream at point sample site #1 on outlet, approximately 160 m downstream from lake.
R5:15	7	View looking upstream at point sample site #1 on inlet entering south end of lake. The site is located 30 m upstream of lake.

Lake: **GRAYLING**

PHOTOGRAPH DIRECTORY

Negative #	Plate #	Description
R5:16	8	View looking downstream at point sample #1 on inlet entering south end of lake. The site is located 30 m upstream of lake.
R5:18	9	View looking downstream from beaver dam on inlet entering west shore of lake. The dam is located approximately 30 m upstream from lake.
R5:14	10	View looking upstream of typical intermittent inlet draining into Grayling Lake.
R5:23	11	Aerial view of flooded swamp located approximately 500 m downstream of lake on outlet. (Plate not indicated on airphoto.)

Lake: GRAYLING

Plate 1: Aerial view of Grayling Lake looking south.

Lake: **GRAYLING**

Plate 2: Panoramic view of Grayling Lake shoreline looking north (toward outlet) from south end of lake.

Lake: **GRAYLING**

Plate 3: Panoramic view of Grayling Lake shoreline looking south from north end of lake.

Lake: **GRAYLING**

Plate 4: Aerial view of Grayling Lake outlet looking south. Arrow indicates beaver dam on outlet, approximately 35 m downstream from lake.

Plate 5: View looking upstream from breached beaver dam on outlet, approximately 110 m downstream from lake. Arrows indicate the beaver dams located at 35 m and 80 m downstream from lake, respectively.

Lake: **GRAYLING**

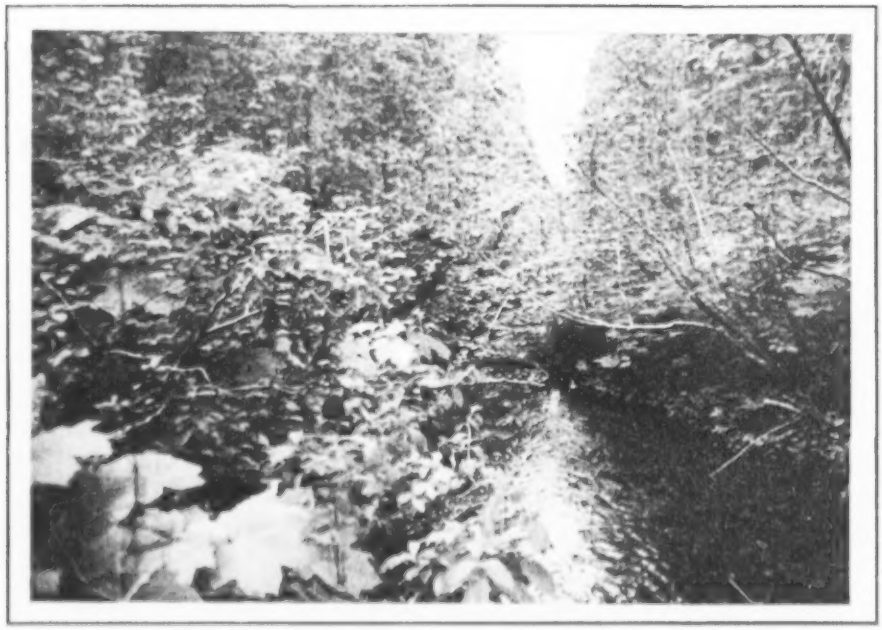


Plate 6: View looking downstream at point sample site #1 on outlet, approximately 160 m downstream from lake.

Plate 7:
View looking upstream at point sample site #1 on inlet entering south end of lake. The site is located 30 m upstream of lake.

Lake: GRAYLING

Plate 8:
View looking downstream at point sample #1 on inlet entering south end of lake. The site is located 30 m upstream of lake.

Plate 9: View looking downstream from beaver dam on inlet entering west shore of lake, the dam is located approximately 30 m upstream from lake.

Lake: **GRAYLING**

Plate 10:
View looking upstream of typical intermittent inlet draining into Grayling Lake.

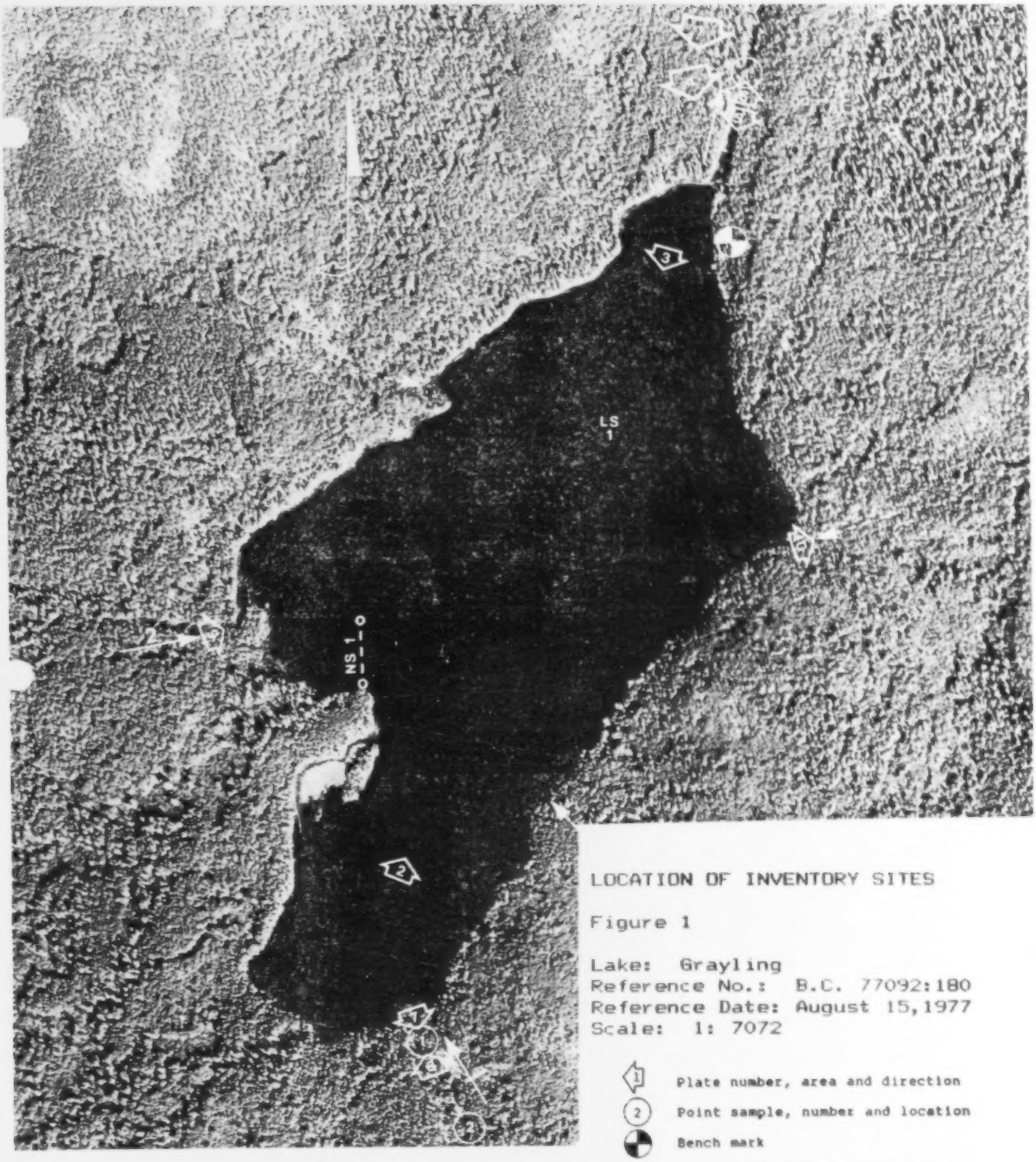
Plate 11: Aerial view of flooded swamp located approximately 500 m downstream of lake on outlet. (Plate not indicated on airphoto.)

Lake: GRAYLING

Appendix A

LABORATORY REPORT

Water Chemistry Analysis



LOCATION OF INVENTORY SITES

Figure 1

Lake: Grayling
Reference No.: B.C. 77092:180
Reference Date: August 15,1977
Scale: 1: 7072

1 Plate number, area and direction

2 Point sample, number and location

Bench mark

LS 1 Limno station location and number

0----0 NS 1 Netting site location and number

1 Stream flow direction and number

- - - - Intermittent stream

TENCO ENVIRONMENTAL INC.
B.C. LABORATORY SERVICES
Report for Form 0000000A0

Site: NOSITE GRAVLINE LK

B.C. MINISTRY OF ENVIRONMENT
JUL 09 1990
RECEIVED
PRINCE GEORGE, B.C.

[illegible] JOHN ENVIRONMENTAL INC. Page 2
B.C. LABORATORY SERVICES
Report For Form 0000000C

[illegible] PRINCE GEORGE ATTN: JEROME D Sample #C0004943

Site: NOSITE GRAVELLY LK

From: 90/04/26 0000 To: 90/04/26 0002
Depth Range: 00.0 - 00.0 Tide:
Sample Grade: Fresh Water
Sample Comment:

Parameter Description	Result	Units	Analytical Technique (Source/Method/Fraction)
pH	7.6	pH units	Automated pH Meter (0000A1220/02/01)
Residue,Nonfilt	2	mg/L	Grav. @ 104 Summer (105C (0000B1070/02/01)
Specific Conductance	142	uS/cm	Temp Meter Stabala (0000A1040/02/01)
Nox (Nitrate & Nitr	130	ug/L	Spectrometric 0.2u Filter (0000M1032/09/01)
Nitrogen, Total	102	ug/L	Automated Electrometer (0000A1810/02/01)

Lake: GRAYLING

Appendix B

TRIBUTARY STREAM DATA

Lake: **GRAYLING**

System Name: **Unnamed Creek** **Outlet**

System No.: **25-1190-010**

Site location: Sample site #1, approximately 160 m downstream of lake.

Date:	June 25, 1990	Time:	1600 hrs
Channel Width:	8.0 m	Water Temp.:	18 °C
Wetted Width:	3.0 m	Stage (flow):	moderate
Max. Depth:	0.28 m	Velocity:	0.33 m/sec
Avg. Depth:	0.22 m	Field Gradient:	1.5%
Turbidity:	0.28 m+	Colour:	gin clear

Flood Signs:
Height: 0.25m
Type: eroded bank

Substrate Breakdown:

Fines	Small Gravel	Large Gravel	Cobble
8%	55%	20%	15%

Boulder	Bedrock
2%	0%

Substrate Compaction: low Sand: 20 %

Banks:

	Form	Height	Stability
Right	undercut	50 cm	very stable: moss, roots and ferns stabilize banks
Left	flat	10 cm	very stable: moss, roots and ferns stabilize banks

Comments:
Stream is gin clear.
Field gradient only over 10 m due to overhanging vegetation.
Point site location has excellent salmonid spawning and rearing habitat.
Site is representative of the stream, downstream from the beaver dams.
Approximately 60% of the overhang consists of devils clubs, alder & ferns.
No overwintering habitat due to lack of deep pools.

Lake: **GRAYLING**

System Name: **Unnamed Creek** **Inlet**

System No.:

Site location: Inlet #1 entering south end of lake. Site #1, approximately 30 m upstream of lake.

Date:	June 25, 1990	Time:	1800 hrs
Channel Width:	5.0 m	Water Temp.:	7°C
Wetted Width:	1.7 m	Stage (flow):	moderate
Max. Depth:	0.15 m	Velocity:	0.29 m/sec
Avg. Depth:	0.08 m	Field Gradient:	2.5%
Turbidity:	0.15 m+	Colour:	gin clear

Flood Signs:

Height: 0.11 m
Type: eroded bank

Substrate Breakdown:

Fines	Small Gravel	Large Gravel	Cobble
20 %	55 %	20%	5 %

Boulder	Bedrock
0 %	0 %

Substrate Compaction: low to moderate Sand: 25 %

Banks:

	Form	Height	Stability
Right	undercut	25.0 cm	stable: rooted vegetation stabilizes banks
Left	flat	6.0 cm	stable: rooted vegetation stabilizes banks

Comments:

Field gradient measured over 7 m.
Spawning ranges from fair to good and probably occurs within the first 50 m upstream of the lake.
Rearing ranges from fair to good, with overhang and large organic debris providing cover.
No overwintering habitat present.
This inlet probably accounts for most of the salmonid recruitment back to the lake.

Lake: **GRAYLING**

System Name: **Unnamed Creek** **Inlet**

System No.:

Site location: Inlet #1 entering south end of lake. Site #2, approximately 175 m upstream of lake.

Date:	June 26, 1990	Time:	1530 hrs
Channel Width:	4.5 m	Water Temp.:	11.5° C
Wetted Width:	1.7 m	Stage (flow):	moderate
Max. Depth:	0.16 m	Velocity:	0.29 m/sec
Avg. Depth:	0.10 m	Field Gradient:	1.5%
Turbidity:	0.16 m+	Colour:	gin clear

Flood Signs:
Height: 0.10m
Type: eroded bank

Substrate Breakdown:

Fines	Small Gravel	Large Gravel	Cobble
10%	65%	20%	5%

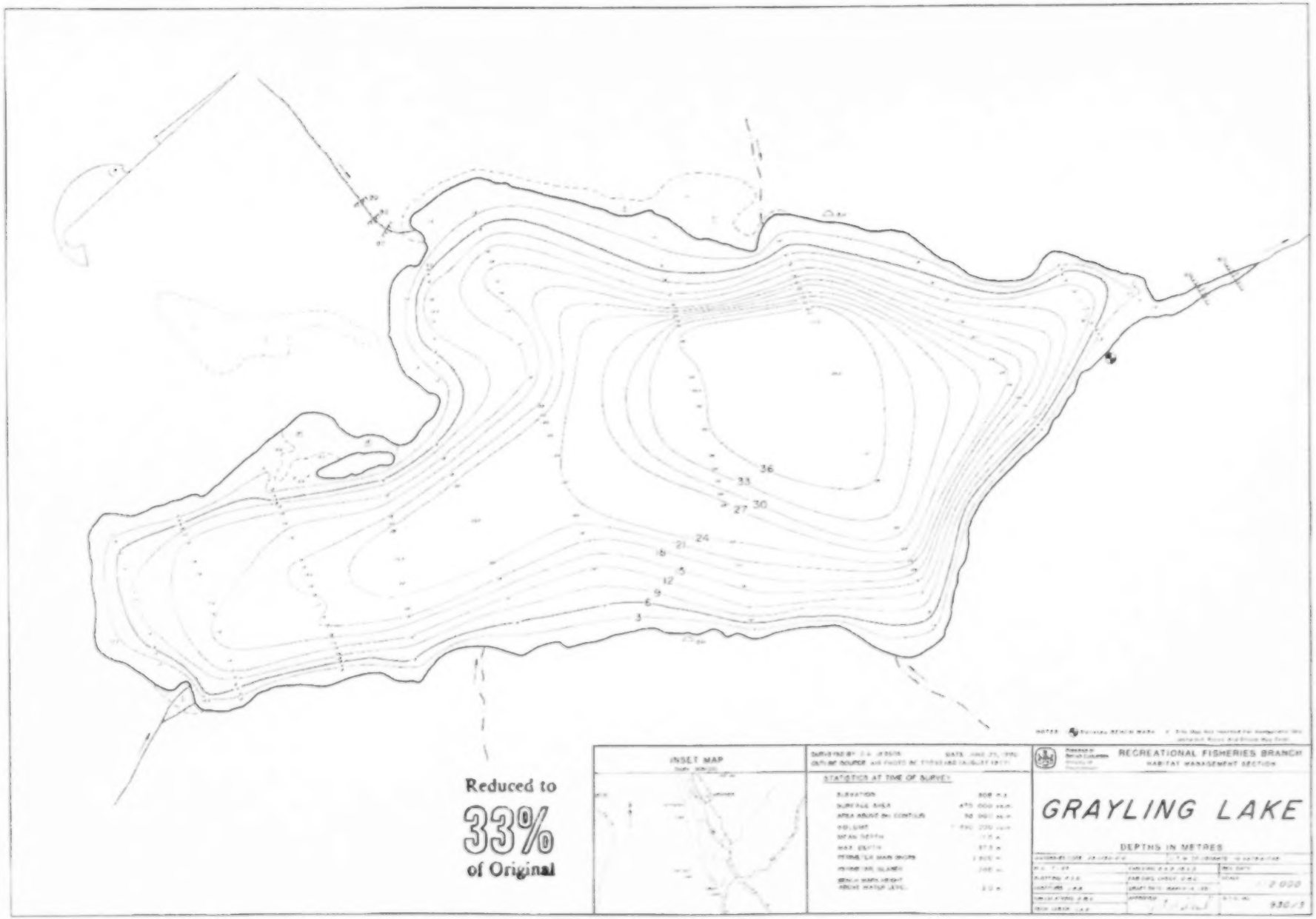
Boulder	Bedrock
0%	0%

Substrate Compaction: low to moderate Sand: 30 %

Banks:

	Form	Height	Stability
Right	undercut	20.0 cm	stable: rooted vegetation stabilizes bank
Left	undercut	16.0 cm	stable: rooted vegetation stabilizes bank

Comments:
Field gradient was measured over 8 m.
Site is a riffle.
Good spawning and pre-winter rearing habitat present.
Stream appears to be stable.
This inlet probably accounts for most of the salmonid recruitment back to the lake.



Reduced to
33%
of Original